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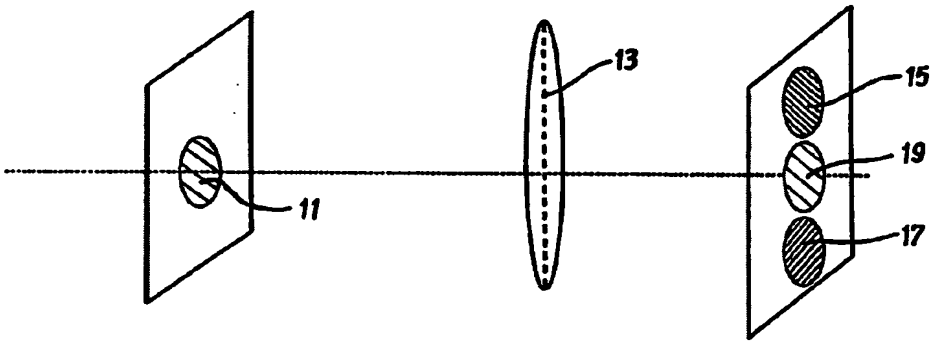
(54) Title: PHASE-DIVERSITY WAVEFRONT SENSOR



(57) Abstract: A measuring apparatus comprising a novel wavefront sensor having a novel aberration means which can be constructed as a diffractive optical element (DOE) and which is suitable for use in adaptive optics. The measuring apparatus can determine the shape of an input radiation wavefront, which is mathematically describable at a pre-determined location in an optical system. The apparatus has aberration means, the shape of which is defined by a filter function, detection means with a radiation sensitive surface for detecting the intensity of incident radiation on the surface. The detection means is coupled to an output device that provides a measure of the intensity of the incident radiation. The aberration means is shaped according to a generalised mathematical formula to act on any input wavefront shape to produce first and second output radiation signals that in combination provide data from the output device on the extent to which the wavefront shape is non-planar. The apparatus is able to analyse wavefronts which are scintillated or discontinuous or which has disconnected wavefront segments.

WO 2004/113856 A1